

WHAT IS CLAIMED IS:

1. A method for processing receive diversity signals, comprising:
receiving a downlink signal at a plurality of antennas of a mobile device, the
downlink signal comprising information;
5 generating a plurality of diversity signals associated with the downlink signal,
each of the plurality of antennas operable to generate a diversity signal of the plurality
of diversity signals;
applying a delay to at least one of the plurality of diversity signals, the delay
being less than one chip duration; and
10 processing the plurality of diversity signals using the delay to obtain the
information, the delay operable to allow at least two diversity signals associated with
the downlink signal to be distinguishable.
2. The method of Claim 1, wherein the delay comprises a delay of 0.4 to
15 0.8 microseconds.
3. The method of Claim 1, further comprising summing the plurality of
diversity signals after applying the delay to yield a combined signal comprising the
delayed at least one of the plurality of diversity signals.
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4. The method of Claim 3, wherein processing the plurality of diversity
signals to obtain the information further comprises:
separating the combined signal in the time domain to yield a plurality of
fingers, the plurality of fingers corresponding to the plurality of diversity signals, at
25 least one finger of the plurality of fingers comprising the delay;
coherently combining the plurality of fingers to yield a combined symbol
signal, the combined symbol signal corresponding to the downlink signal; and
decoding the combined symbol signal to generate the information.
- 30 5. The method of Claim 3, further comprising converting the combined
signal from analog mode to digital mode.

6. The method of Claim 1, wherein generating the plurality of diversity signals further comprises filtering each of the diversity signals received from the plurality of antennas.

7. A system for processing receive diversity signals, comprising;
a plurality of antennas operable to:

receive a downlink signal, the downlink signal comprising
information; and

5 generate a plurality of diversity signal associated with the downlink
signal, each of the plurality of antennas operable to generate a diversity signal of the
plurality of diversity signals;

a delay module coupled to the plurality of antennas and operable to apply a
delay to at least one of the plurality of diversity signals, the delay being less than one
10 chip duration; and

a processor coupled to the delay module and operable to process the plurality
of diversity signals using the delay to obtain the information, the delay operable to
allow at least two diversity signals associated with the downlink signal to be
distinguishable.

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8. The system of Claim 7, wherein the delay comprises a delay of 0.4 to
0.8 microseconds.

9. The system of Claim 7, further comprising an antenna combiner
20 operable to:

sum the plurality of diversity signals after applying the delay; and

yield a combined signal comprising the delayed at least one of the plurality of
diversity signals.

25 10. The system of Claim 9, further comprising an analog-to-digital
converter operable to convert the combined signal from analog mode to digital mode.

11. The system of Claim 9, wherein the processor further comprises:

a rake receiver module operable to:

separate the combined signal in the time domain to yield a plurality of fingers, the plurality of fingers corresponding to the plurality of diversity signals, at

5 least one finger of the plurality of fingers comprising the delay; and

coherently combine the plurality of fingers to yield a combined symbol signal, the combined symbol signal corresponding to the downlink signal; and

a decoder coupled to the rake receiver module and operable to decode the combined symbol signal to generate the information.

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12. The system of Claim 11, wherein the processor comprises a baseband processor.

13. The system of Claim 7, further comprising a plurality of filters, each
15 filter of the plurality of filters coupled to an antenna of the plurality of antennas and operable to filter each of the diversity signals received from the plurality of antennas.

14. A method for processing transmit diversity signals, comprising:
receiving a transmit signal at a splitter, the transmit signal comprising
information;
splitting the transmit signal into a plurality of split signals;
5 applying at least one delay to at least one of the plurality of split signals to
yield a plurality of transmit diversity signals; and
transmitting the plurality of transmit diversity signals at a plurality of antennas
in order to process the plurality of transmit diversity signals, the transmit diversity
signals comprising the information.

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15. The method of Claim 14, wherein the at least one delay comprises a
delay in the range between 0.25 microseconds and ten microseconds.

16. The method of Claim 14, wherein:
15 the at least one delay comprises a first delay and a second delay, the first delay
being less than the second delay; and
applying the at least one delay to the at least one of the plurality of split
signals further comprises:
introducing the first delay at a first split signal of the plurality of split
20 signals; and
introducing the second delay at a second split signal of the plurality of
split signals.

17. The method of Claim 16, wherein the first delay comprises a delay in
25 the range between 0.25 microseconds and five microseconds.

18. The method of Claim 16, wherein the second delay comprises a delay
in the range between 0.5 microseconds and ten microseconds.

19. The method of Claim 14, wherein applying at least one delay to at least
30 one of the plurality of split signals further comprises buffering the at least one of the
plurality of split signals to introduce the at least one delay.

20. A system for processing a transmit signal, comprising:
a splitter operable to:
receive a transmit signal, the transmit signal comprising information;
5 and
split the transmit signal into a plurality of split signals;
a delay module coupled to the splitter and operable to apply at least one delay
to at least one of the plurality of split signals to yield a plurality of transmit diversity
signals; and
10 a plurality of antennas operable to transmit the plurality of transmit diversity
signals in order to process the plurality of transmit diversity signals, the transmit
diversity signals comprising the information.
21. The system of Claim 20, wherein the at least one delay comprises a
15 delay in the range between 0.25 microseconds and ten microseconds.
22. The system of Claim 20, wherein:
the at least one delay comprises a first delay and a second delay, the first delay
being less than the second delay; and
20 the delay module further operable to:
introduce the first delay at a first split signal of the plurality of split
signals; and
introduce the second delay at a second split signal of the plurality of
split signals.
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23. The system of Claim 22, wherein the first delay comprises a delay in
the range between 0.25 microseconds and five microseconds.
24. The system of Claim 22, wherein the second delay comprises a delay
30 in the range between 0.5 microseconds and ten microseconds.

25. The system of Claim 20, wherein the delay module comprises a buffer operable to introduce the at least one delay.

26. A system for processing receive diversity signals, comprising:
- means for receiving a downlink signal at a plurality of antennas of a mobile device, the downlink signal comprising information;
 - means for generating a plurality of diversity signals associated with the
5 downlink signal, each of the plurality of antennas operable to generate a diversity signal of the plurality of diversity signals;
 - means for applying a delay to at least one of the plurality of diversity signals, the delay being less than one chip duration; and
 - means for processing the plurality of diversity signals using the delay to obtain
10 the information, the delay operable to allow at least two diversity signals associated with the downlink signal to be distinguishable.

27. A system for processing transmit diversity signals, comprising:

means for receiving a transmit signal at a splitter, the transmit signal comprising information;

means for splitting the transmit signal into a plurality of split signals;

5 means for applying at least one delay to at least one of the plurality of split signals to yield a plurality of transmit diversity signals; and

means for transmitting the plurality of transmit diversity signals at a plurality of antennas in order to process the plurality of transmit diversity signals, the transmit diversity signals comprising the information.

28. A system for processing receive diversity signals, comprising;
a plurality of antennas operable to:
receive a downlink signal, the downlink signal comprising
information; and
5 generate a plurality of diversity signal associated with the downlink
signal, each of the plurality of antennas operable to generate a diversity signal of the
plurality of diversity signals;
a plurality of filters, each filter of the plurality of filters coupled to an antenna
of the plurality of antennas and operable to filter each of the diversity signals received
10 from the plurality of antennas;
a delay module coupled to at least one of the plurality of filters and operable to
apply a delay to at least one of the plurality of diversity signals, the delay being less
than one chip duration, the delay comprising a delay of 0.4 to 0.8 microseconds;
an antenna combiner operable to:
15 sum the plurality of diversity signals after applying the delay; and
yield a combined signal comprising the delayed at least one of the
plurality of diversity signals;
an analog-to-digital converter operable to convert the combined signal from
analog mode to digital mode; and
20 a processor coupled to the delay module and operable to process the combined
signal using the delay to obtain the information, the delay operable to allow at least
one multipath signal associated with the downlink signal to be distinguishable, the
processor comprising a baseband processor, the baseband processor comprising:
a rake receiver module operable to:
25 separate the combined signal in the time domain to yield a plurality of
fingers, the plurality of fingers corresponding to the plurality of diversity signals, at
least one finger of the plurality of fingers comprising the delay; and
coherently combine the plurality of fingers to yield a combined symbol
signal, the combined symbol signal corresponding to the downlink signal; and
30 a decoder coupled to the rake receiver module and operable to decode the
combined symbol signal to generate the information.

29. A system for processing a transmit signal, comprising:
a splitter operable to:
receive a transmit signal, the transmit signal comprising information;
and
5 split the transmit signal into a plurality of split signals;
a delay module coupled to the splitter and operable to:
apply at least one delay to at least one of the plurality of split signals to
yield a plurality of transmit diversity signals, the delay module comprising a buffer
operable to introduce the at least one delay, the at least one delay comprising a first
10 delay and a second delay, the first delay being less than the second delay;
introduce the first delay at a first split signal of the plurality of split
signals, the first delay comprising a delay in the range between 0.25 microseconds
and five microseconds; and
introduce the second delay at a second split signal of the plurality of
15 split signals, the second delay comprising a delay in the range between 0.5
microseconds and ten microseconds; and
a plurality of antennas operable to transmit the plurality of transmit diversity
signals in order to process the plurality of transmit diversity signals, the transmit
diversity signals comprising the information.